INSIGHT INTO STATE AND LOCAL GOVERNMENT RESPONSIBILITIES FOR EFFECTIVE WATERSHED MANAGEMENT IN GEORGIA

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Abstract. Since the passage of the Clean Water Act in 1972, federal efforts to control water quality have shifted away from solely relying on traditional end-of-pipe regulation to a more unified "watershed" management approach. This shift has been accompanied by the transference of water quality responsibilities from federal to state and local governments (e.g. total maximum daily loads (TMDLs) and erosion and sedimentation control). There is considerable federal and state support for a watershed management approach, but very few details exist concerning the implications this shift will have on local governments. This paper highlights federal and state efforts in protecting water quality through watershed management; recognizes the disjoint between water quality authority and land use authority; and also provides insight for more efficient watershed management in Georgia.

INTRODUCTION

The federal government officially endorsed watershed management in the Environmental Protection Agency's (EPA) Watershed Protection Approach in 1991 (EPA Office of Water 1996). Now, eight years after its inception, the watershed management approach is considered an effective and efficient means of protecting water quality. Generally, it is defined as a comprehensive approach to meet water quality goals. Watershed management takes into account human health and ecological integrity, and focuses on both point and nonpoint sources of water pollution within a given watershed (i.e. drainage basin). Watershed management is a complex matter involving not only point and nonpoint source pollution control, but also watershed planning (which involves land use planning and control) and establishing a means of measuring success (either through monitoring or other data gathering).

Many federal and state laws and initiatives support a watershed management approach to maintaining surface water quality in Georgia. The most commonly cited federal acts, the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA), mandate a myriad of state protection measures. More recently, however, the federal government initiated the Clean Water Action Plan (CWAP) which encourages, among other things, state and local watershed management approaches and more state and local governmental participation. The state of Georgia has also passed many laws and adopted regulations supporting watershed management. For example, the Georgia River Basin Management Planning Act of 1992, established requisite for the Georgia Environmental Protection Division (EPD) organizes a program to develop management plans for the major river basins in the state.

Through years of scientific research, it has been found that land use directly affects water quality (GA DNR 1998). Therefore, to effectively protect water quality through a watershed management approach, land use planning and management and water quality protection efforts should be coupled. Land use authority primarily rests with local governments, while water quality authority rests primarily with state and federal governments. With this dichotomy in mind, it is apparent that local governing authorities play a critical role in watershed planning and management.

BACKGROUND

Federal efforts supporting watershed management

Federal support for watershed management is abundant. The EPA's Office of Water supports the watershed protection approach as the primary mechanism for achieving clean water and healthy sustainable ecosystems throughout the Nation (EPA Office of Water, National Water Quality Inventory 1996). Section 304(a)(2) of the CWA, charges the EPA administrator with the responsibility of identifying pollutants suitable for TMDL measurements. TMDLs are defined as the total amount of point and nonpoint source pollutants that enter a waterbody. Under section 303(d) the states are mandated to establish and enforce the TMDLs. Prior to this directive, water quality protection efforts were almost solely based on technological improvements and permitting of point source pollution, rather than attempts to control both point and nonpoint sources of pollution (Doppelt et al. 1993, 159; TMDL Program, online). Also, through the CWA, section 319 focuses primarily on nonpoint source pollution control. This section allows money to be allocated specifically for

the development and implementation of Watershed Restoration Action Strategies, which are part of the Clean Water Action Plan (CWAP) initiated in 1997.

Under the federal Safe Drinking Water Act (SDWA), local governments are required to assess source water quality to ensure the water does not threaten human health. The SDWA also mandates that the EPA assist local governments and community water systems in developing partnerships and assessing source water quality (SDWA § 1452(g) and SDWA Amendments of 1996, online). These efforts are intended to give states and communities the tools they need to prevent contamination of the drinking water supply source (SDWA – One Year Later, online).

The CWAP is the most recent federal initiative for clean water. It is structured around four major tools to help governments achieve clean water goals, three of which directly address watershed management. The tools include compiling unified watershed assessments, initiating watershed restoration action strategies, and participating in watershed pollution prevention efforts (CWAP 1997).

State-wide efforts supporting watershed management

At the state level, Georgia has responded to the shift away from end-of-pipe regulation for water quality control in many ways. By adopting the Georgia Water Quality Control Act of 1964 and its amendments, the state gained primacy over water quality protection. The 1975 Erosion and Sedimentation Act regulates land disturbing activities that can result in soil erosion and the movement of sediment into state waters or onto state lands (Cowie and Hardy 1997). Water supply watersheds are recognized as vital areas of the state to be addressed and protected under comprehensive plans in the 1989 Georgia Planning Act. The Georgia Planning Act also requires local governments to develop land use plans for their jurisdictions. The 1992 Georgia River Basin Management Planning Act requires the Georgia EPD to develop river basin management plans for the sixteen major river basins in the state (O.C.G.A §12-5-520 to 525).

DISJOINT BETWEEN LAND AND WATER AUTHORITY

Although watershed management has been justly supported through the major federal and state efforts discussed above, the efforts fail to recognize one major factor essential to successful water quality protection: *land use authority rests primarily with local governments*. Scientific evidence shows that since the passage of the CWA and the resultant decrease in point source pollutants, nonpoint sources contribute the greatest amount of pollution to the nation's waterbodies and that land use activities (i.e. agricultural practices and urbanization) are the most influential factor affecting water quality (GA DNR 1998; Waters 1995; Shirmohammadi et al. 1996; Kuhnle et al. 1996; Allan et al. 1997). Specifically, in Georgia, there has been a decline in the abundance of fish species due to erosion and sedimentation (Burkhead et al. 1997; Barnes et al. 1997). Excess nutrients from various land use activities also negatively impact water quality in Georgia (Frick et al. 1996; DeVivo 1996).

In order for watershed management to be fully successful, land use and water quality authority should be coupled. This coupling, in essence, proposes that local governments will have much more responsibility in protecting water quality than they have had in previous years. However, this shift in governmental responsibility raises many questions, including change in roles of state and local governments and the capacity of local governments to carry out watershed management responsibilities. To better understand the changes that are occurring in watershed management, the following survey was developed to gain insight from those persons directly involved in watershed management.

SURVEY

At the time of this writing, the survey has been developed and administered, but the results have not been completely analyzed.

Research design

The research instrument was designed as a three part survey to be conducted as a telephone interview. The survey was composed of both open-ended questions (for qualitative analysis) and a priority ranking system (for quantitative analysis). The questionnaire was sent to the participants prior to the interview to prepare them for the actual telephone conversation. Some respondents were unable to participate through a telephone interview, but sent their responses in via e-mail or fax. The telephone interviews were taped to ensure accuracy in reporting results, but confidentiality was assured.

The survey was divided into three major parts. Part I was designed to discover what the respondents feel are the roles of state and local governments and the capacity of local governments to carry out their responsibilities. Part II was designed as a ranking system of important components of watershed management based on the EPA's Top Ten Watershed Lessons Learned (EPA Top Ten). Part III was designed to gain insight into issues that need to be addressed for watershed management to be successful in Georgia. These key issues addressed in Part III of the survey include: 1) tailoring local ordinances and regulations to better address water quality; 2) coupling land use control efforts of local governments and water management responsibilities of water utilities and authorities; 3) encouraging governmental cooperation for multi-jurisdictional watersheds; and 4) encouraging local governments of headwater jurisdictions to participate in

watershed management programs when they may not receive direct benefits from their efforts.

Research participants

Four groups of governmental and non-governmental representatives were chosen to participate: state government officials, local government officials, regional development center representatives (RDC), and other active parties (OAP). The state government officials represent the entire state geographically, but focus primarily on surface water issues. The local government respondents serve the North Georgia mountain and piedmont areas, which use surface water rather than ground water as primary water source. Local officials contacted include elected and appointed local officials and represent both urban and rural areas, as well as cities and counties. Respondents from the regional development centers represent the five northern RDCs in Georgia: Coosa Valley, North Georgia, Northeast Georgia, Georgia Mountains, and the Atlanta Regional Commission. Other active party (OAP) respondents represent non-governmental non-profit organizations and independent consulting firms. In total 11 state government officials, 11 local government officials, 5 RDC representatives and 10 OAP representatives participated. The survey respondents were not randomly chosen, but chosen for their expertise in water related issues and their decision making position.

Data analysis

Responses to Part I and III are to be analyzed qualitatively to discern commonalities and disjunctions. Statistical analyses are to be run on the responses to Part II to discover any significant differences between perceptions of the importance of each watershed management component among the four different groups interviewed. The analyses of the survey results are currently being conducted.

Preliminary Results

Table 1 presents preliminary results relating to the role of local governments in watershed management. Preliminary results of the survey suggest the following:

- Both state and local government officials believe that increased local government involvement is needed for watershed management to be effective.
- Regional cooperation among local governments is necessary to effectively manage watersheds that transcend jurisdictional boundaries.
- Increased technical and financial support is necessary for local governments to be able to carry out watershed management activities.
- Leadership, planning and public involvement/education are identified as the most important factors in making watershed management a reality.

Although these results are preliminary, they indicate where efforts should be placed in promoting watershed management in Georgia.

Table 1. Preliminary results of Part I, Q2: the role of local governments in watershed management. Numbers in table indicate the percent of respondents in each group that discussed the ascribed theme.

	State	Local	RDC	OAP
Development of plans				
Develop the plans	18			
Develop a land use plan	27	9		44
Develop a watershed protection plan	18		20	
Implementation of plans				
Implement the plans	27	9		
Implement watershed protection plan		9	40	
Pass and enforce local ordinances	18	27	40	22
Soil erosion control		18		
Stormwater management		18		11
Buffer areas		18		
Control land use	9	27		44
Leadership				
Take the leadership role	9	18		22
Take responsibility for water that flows through individual jurisdiction	9	18		
Educate and inform citizens	9			11

CONCLUSIONS

The preliminary results indicate that the RDC, OAP, and especially state participants concentrated their responses on land use and watershed planning, while local government participants focused more on the implementation of various land use controls. Considering land use plans are required of local governments under the Georgia Planning Act of 1989, local governments have most likely focused more on the implementation of plans and on adopting ordinances to carry out the land use plans. However, the land use plans that approximately 99 percent of Georgia's local governments have adopted are not always conducive to sound watershed management. This is simply because the plans were not developed specifically with watershed management as an objective and land use plans follow political boundaries alone while watersheds do not.

Local governments have the ability and authority to manage on a watershed level for their jurisdictions. Quite possibly, local government officials have not yet made the connection between their existing land use plans and

watershed management. However, because of the interjurisdictional nature of watersheds, regional cooperation will frequently be required. For local governments to effectively manage on a watershed basis, it will be necessary to change the focus of their planning and local land use control efforts to a broader context. To do so technical assistance and, in some cases, financial assistance from state and federal agencies is necessary.

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LITERATURE CITED

Allan, J. David, Donna L. Erickson, and John Fay. 1997. "The influence of catchment land-use on stream integrity across multiple spatial scales." *Freshwater Biology*, vol.37, no.1 (Feb.): 149-161.

Barnes, Kevin H., Judy L. Meyer, and Byron J. Freeman. 1997. "Sedimentation and Georgia's fishes: An analysis of existing information and future research." In *Proceedings of the 1997 Georgia Water Resources Conference* held in Athens, GA 20-22 March 1997, edited by Kathryn J. Hatcher, 139-143.

Burkhead, Noel M., Stephen J. Walsh, Byron J. Freeman, and James D. Williams. 1997. "Status and Restoration of the Etowah River, an Imperiled Southern Appalachian Ecosystem." In *Aquatic Fauna in Peril: The Southeastern Perspective*, edited by George W. Benz and David E. Collins. Special Publication 1, Southeast Aquatic Research Institute, Lenz Design& Communications, Decatur, Georgia, 554 p.

Cowie, Gail and Paul Hardy. 1997. *Environmental Management Requirements for Stream and River Corridors in Georgia*. Prepared for the Georgia Environmental Protection Division. Institute of Community and Area Development, University of Georgia. 73 p.

DeVivo, J.C. 1996. "Fish Assemblages as Indicators of Water Quality Within the Apalachicola-Chattahoochee-Flint (ACF) River Basin." Masters Thesis, University of Georgia.

Doppelt, Bob, May Scurlock, Chris Frissell, and James Karr – The Pacific Rivers Council. 1993. *Entering the Watershed – A New Approach to Save America's River Ecosystems*. Washington, D.C.: Island Press.

EPA Office of Water – Watershed Approach: an Introduction. Available [online] http://www.epa.gov/OWOW/watershed/index2.html

EPA Office of Water – Watershed Approach Framework.. June 1996. Available [online] -- http://www.epa.gov/OWOW/watershed/framework.html

EPA Top Ten Watershed Lessons Learned. Available online – http://www.EPA.gov/owow/watershed/lessons/

Frick, E.A., G.R. Buell, and E.E. Hopkins. 1996. *Nutrient Sources and Analysis of Nutrient Water-Quality Data, Apalachicola-Chattahoochee-Flint River Basin, Georgia, Alabama, and Florida, 1972-90.* National Water-Quality Assessment Program. U.S. Geological Survey: Atlanta, Gerogia.

Kuhnle, Roger A., Ronald L. Binger, George R. Foster, and Earl H. Grissinger. 1996. "Effect of Land Use Changes on Sediment Transport in Goodwin Creek." *Water Resources Bulletin*, vol.32, no.10 (Oct.): 3189-3196.

National Water Quality Inventory: 1996. Environmental Protection Agency (EPA) Water Quality Report to Congress. Available online – http://www.epa.gov/305b/

Report of Georgia's Environment '98. 1998. Georgia Department of Natural Resources Environmental Protection Division. Atlanta, GA: DNR/EPD.

Safe Drinking Water Act – One Year Later – "Successes In Advancing public Health Protection.". US EPA Office of Water. EPA 810-F-97-002 (Sept 1997). Available online – http://www.epa.gov/OGWDW/year1/sdwahtm.html

Safe Drinking Water Act Amendments of 1996 – General Guide to Provisions. US EPA Office of Water. Available online – http://www.epa.gov/OGWDW/SDWAsumm.html

Shirmohammadi, Adel, Kwang S.Yoon, and William L. Magette. 1996. "Water quality in a mixed land-use watershed – Piedmont Region." *Journal of Environmental Science and Health*: Part A, vol.31, no.2: 429-450.

"Total Maximum Daily Load (TMDL) Program." Memorandum. US EPA Office of Water, Office of Wetlands, Oceans and Watershed. Available online – http://www.epa.gov.OWOW.tmdl/ratepace.html